HT46CL1 Laser diffuse reflection light scanner with background suppression

en 01-2016/09 50134542

50 … 1000mm
800mm with
black-white error < 10%

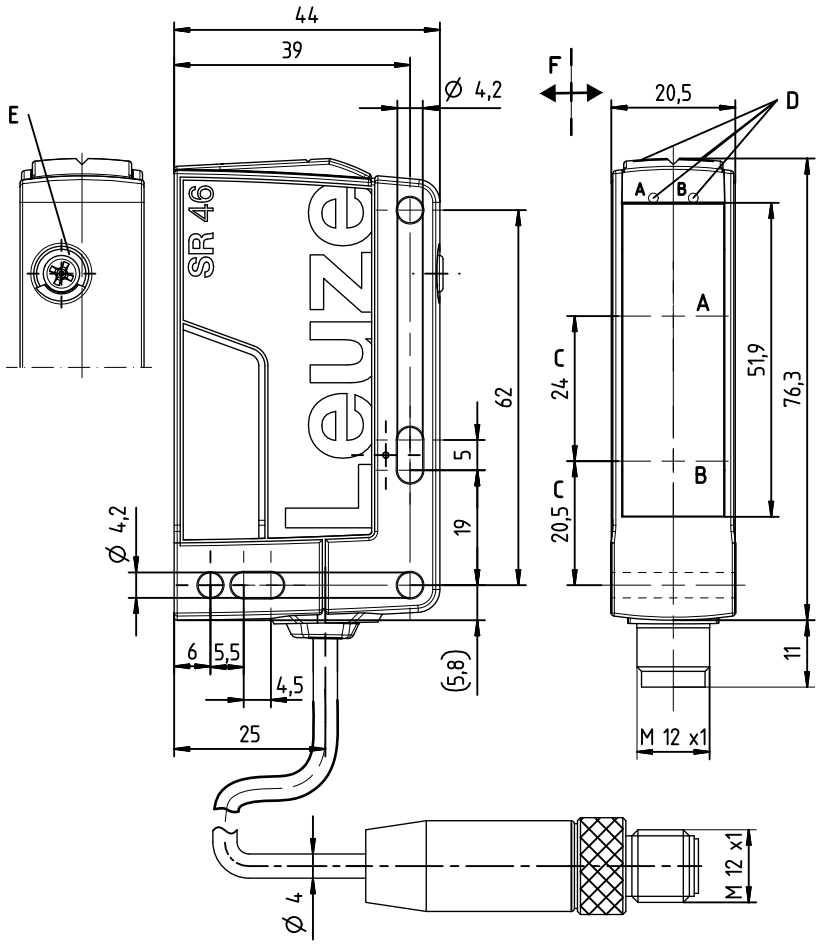
- Scanner with adjustable background suppression
- Exact positioning and detection of small parts by means of a red light laser beam
- Secure detection of fast events
- Highly visible status displays
- Exact switching point adjustment through mechanical adjusting spindle
- Activation input for sensor test
- Various switching output functions for universal connection to existing control environment
- A²LS active ambient light suppression for avoiding mutual interference
- Robust plastic housing in degrees of protection IP67 and IP69K
- Laser class 1

Accessories:

(available separately)

- Mounting systems (BT 46, BTU 300M, BT 300, BTU 346)
- M12 connectors (KD …)
- Ready-made cables (K-D …)

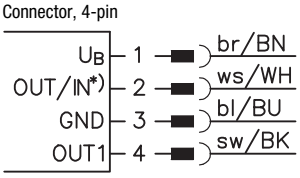
Dimensioned drawing



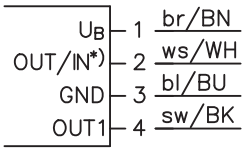
A Receiver
B Transmitter
C Optical axis
D_A Green indicator diode
D_B Yellow indicator diode
E Scanning range adjustment
F Preferred movement for objects

Electrical connection

Connector, 4-pin



Cable



Selection pin 2

*)	OUT	IN
	OUT 2	active
	NC	deactive

Specifications

Optical data

Typ. scanning range limit (white 90 %) [1]		50 … 1000 mm
Scanning range [2]		see diagrams
Black-white error		<10 % up to 800 mm
Scanning range adjustment		mechanical adjusting spindle
Adjustment range		120 … 1000 mm
Light source		laser, pulsed
Laser class		1 acc. to IEC 60825-1:2007
Wavelength		655 nm (visible red light)
Max. output power		≤ 3.5 mW
Pulse duration		≤ 5 µs
Light spot		approx. 3 mm x 5 mm at 1000 mm

Timing

Switching frequency	250 Hz
Response time	2 ms
Delay before start-up	≤ 100 ms

Electrical data

Operating voltage U_B [3]		10 … 30 VDC (incl. residual ripple)
Residual ripple		≤ 15 % of U_B
Open-circuit current		≤ 20 mA
Switching outputs/functions [4]	/4P	2 PNP switching outputs, antivalent
	/4X	1 PNP switching output, light switching
	/48	1 PNP switching output, light switching, 1 activation input
	/PX	1 PNP switching output, dark switching
	/P9	1 PNP switching output, dark switching, 1 deactivation input
	/2N	2 NPN switching outputs, antivalent
Signal voltage high/low		≥ (U_B-2 V)/≤ 2 V
Output current		max. 100 mA

Indicators

Green LED	ready
Yellow LED	reflection

Mechanical data

Housing	plastic	
Optics cover	plastic	
Weight	with M12 connector:	approx. 60 g
	with 200 mm cable and M12 connector:	approx. 65 g
	with 2000 mm cable:	approx.100 g
Connection type	M12 connector, 4-pin	
	cable 200 mm with M12 connector, 4-pin	
	cable 2000 mm, 4 x 0.21 mm²	

Environmental data

Ambient temp. (operation/storage)	-40 °C … +60 °C/-40 °C … +70 °C
Protective circuit [5]	1, 2, 3
VDE safety class [6]	II, all-insulated
Protection class	IP 67, IP 69K
Standards applied	IEC 60947-5-2
Certifications	UL 508, CSA C22.2 No.14-13 [4] [7]

Options

Activation input/Deactivation input

Transmitter active/not active	≥ 8 V/≤ 2 V
Activation/disable delay	≤ 1 ms/≤ 2 ms
Input resistance	10 KΩ ± 10 %

1) Typ. scan. range limit: max. achievable scanning range for light objects (white 90 %)
2) Scanning range: recommended scanning range for objects with different diffuse reflection
3) For UL applications: for use in class 2 circuits only
4) See part number code
5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all transistor outputs
6) Rating voltage 50 V
7) These proximity switches shall be used with UL Listed Cable assemblies rated 30 V, 0.5 A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

Tables

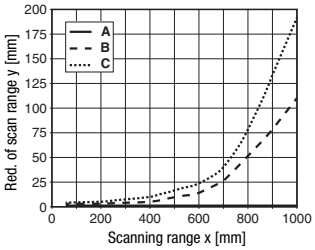
1	50	800
2	70	600
3	90	500

1	white 90 %
2	gray 18 %
3	black 6 %

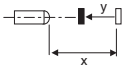
Scanning range [mm]

Diagrams

Typ. black/white behavior



A white 90 %
B grey 18 %
C black 6 %



Remarks

Operate in accordance with intended use!

- This product is not a safety sensor and is not intended as personnel protection.
- The product may only be put into operation by competent persons.
- Only use the product in accordance with the intended use.

HT46CL1 Laser diffuse reflection light scanner with background suppression

Part number code

H	T	4	6	C		L	1		/	4	P	-	2	0	0	-	M	1	2

Operating principle

HT	Diffuse reflection light scanners with background suppression

Series

46C	46C series

Light type

Free	Red light
I	Infrared light

aser class

L1	Laser class 1 according to IEC 60825-1:2007

Setting

Free	Scanning range adjustment via mechanical adjusting spindle

Pin assignment of OUT1 (connector pin 4 / black cable wire)

2	NPN, light switching
N	NPN, dark switching
4	PNP, light switching
P	PNP, dark switching

Pin assignment of OUT/IN (connector pin 2 / white cable wire)

X	Not assigned
2	NPN, light switching
N	NPN, dark switching
4	PNP, light switching
P	PNP, dark switching
8	Activation input (active high)
9	Deactivation input (active high)

Connection technology

M12	M12 conector, 4-pin
200-M12	Cable 200 mm with M12 connector, 4-pin
Free	Cable 2000 mm

Order guide

The sensors listed here are preferred types; current information at www.leuze.com.

Laser diffuse reflection light scanner with background suppression	Designation	Part no.
With M12 connector, 4-pin		
OUT1: PNP light switching; OUT2: PNP dark switching	HT46CL1/4P-M12	50127056
OUT1: PNP light switching; IN: activation input active high	HT46CL1/48-M12	50127058
OUT1: NPN light switching; OUT2: NPN dark switching	HT46CL1/2N-M12	50134607
OUT1: PNP dark switching; IN: deactivation input active high	HT46CL1/P9-M12	50127059
Cable 0.2 m with M 12 connector, 4-pin		
OUT1: PNP light switching; OUT2: PNP dark switching	HT46CL1/4P-200-M12	50127057

Laser safety notices

ATTENTION, LASER RADIATION – LASER CLASS 1

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product in **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24th, 2007.

- Adhere to the applicable legal and local regulations regarding protection from laser beams.
- The device must not be tampered with and must not be changed in any way.
  There are no user-serviceable parts inside the device.
  Repairs must only be performed by Leuze electronic GmbH + Co. KG.